



# INDUSTRIAL INSTRUMENTATION SERVICES, INC.

SOP # CAL-03A

Supersedes: CAL-03

Date Effective: February 20, 2006

**TITLE: Thermocouple Millivolt Calibration**

Revision Period: 2 Year

### PURPOSE:

To provide guidance for Service Technicians performing millivolt calibrations on a thermocouple.

### SCOPE:

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### RESPONSIBILITIES:

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### DEFINITIONS:

#### Calibration:

Determination of the experimental relationship between the quantity being measured and the output of the device which measures it; where the quantity measured is obtained through a recognized standard measurement.

#### Standard/Calibrator:

A measurement device that is certified and referenced to values established by the National Institute of Standards and Technology.

#### NIST (formerly NBS):

Acronym for the National Institute of Standards and Technology, formerly known as the National Bureau of Standards.

#### Range:

The extent of a measuring, indicating or recording scale.

Standard Operating Procedure Circulation List			
Name & Title	Responsibility	Signature	Date
	Author		
	Approver		
	Approver		
	Approver		

As Found Data:

The initial reading of an instrument being calibrated. This data is documented before any changes are made to equipment.

Calibrator Reads:

The initial reading of the calibrator or calibration standard being used to calibrate an instrument. This data is documented before any adjustments are made.

As Left Data:

The final reading of the equipment being calibrated. This data is documented regardless of any adjustments, if necessary are made.

**GENERAL INFORMATION:**

- 1) REMOVED FOR INTERNET

**PROCEDURE:**

- 1) Isolate the thermocouple from the system it is measuring. Label thermocouple wires with + or – if not previously color coded or marked to ensure proper reconnection of the device.
- 2) Carefully remove the thermocouple from the system.
- 3) Set up a temperature reference.
- 4) Place the thermocouple into the temperature reference.
- 5) Place a temperature probe (RTD or thermocouple) into the temperature reference.
- 6) Attach a millivolt calibrator to the thermocouple leads.
- 7) Using the millivolt calibrator, select the appropriate thermocouple type.

Using the temperature reference, temperature probe and the millivolt calibrator, test the thermocouple at REMOVED FOR INTERNET

Document the “As Found Data” for each temperature tested.

- 10) Document the “Calibrator Reads” for each temperature tested.
- 11) Using the “As Found Data” and the “Calibrator Reads Data” calculate the instrument error.
- 12) Determine if the instrument is within the approved tolerance.

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- 13) Thermocouples can not be adjusted and therefore needs to be replaced with a new, calibrated thermocouple. Any attempted to change or replace components must be done in accordance with the customer's procedures.
- 14) Determine and document the "As Left Data" for each temperature tested.
- 15) Disconnect all test equipment.
- 16) Carefully re-install the thermocouple into the system from which it was removed.
- 17) Verify proper operation of all instruments associated in the calibration process.

**EXHIBITS/ATTACHMENTS:**

None

**SOP HISTORY:**

<u>DATE</u>	<u>VERSION</u>	<u>CHANGES</u>
2/6/04	New	Establish Procedure
2/15/06	A	Re-write Step #11

